

Audio Device for Luring Wildlife

TITLE OF INVENTION

Audio device for luring wildlife

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to an animal luring device for attracting wildlife for purposes such as hunting, photography or viewing. More specifically, the present invention relates to a new and improved luring device whereby pre-recorded vocalizations of wildlife, stored as analog signals within an integrated circuit, can be played back to effectively lure wildlife to within closer proximity of the operator of the luring device.

2. DESCRIPTION OF THE PRIOR ART

Many recording and playback devices have been developed for use by hunters, photographers, and wildlife enthusiasts for luring wildlife to within a desirable range. Many wildlife luring devices in use are mechanical in nature in that they are operated by either passing a volume of air across a reed or diaphragm or by mechanical movement between two frictional surfaces. Each of these methods of operating a luring device requires the user of the device to employ physical movement during operation of the device which is apt to prematurely alert wildlife, and both methods require the use of one or both hands, limiting the ability to discharge a weapon or photograph the wildlife. Also, these types of mechanical luring devices are intended to imitate as closely as possible the sounds of wildlife, but lack the realism of recorded wildlife vocalizations. Both U.S. Patent No. 5,230,649 to Robertson (1993) and U.S. Patent No. 4,954,115 to Metiva (1990) are examples of these types of luring devices, depending upon air being blown through a mechanism to create wildlife sounds. U.S. Patent No. 6,159,068 to Trotter (2000) and U.S. Patent No. 6,149,493 to Long (2000) are game call devices that are actuated by friction created by movement between two parts.

Furthermore, there are numerous wildlife luring devices that have been developed using mechanisms such as tape recorders for recording and playback of wildlife sounds, however these devices consume considerably more electric power than solid state electronic devices. U.S. Patent No. 5,239,587 to Muckelrath (1993) and U.S. Patent No. 5,146,353 to Isoguchi (1992) relate to audio or audio/video recording devices that utilize mechanical-type recorders.

BRIEF SUMMARY OF THE INVENTION

Considering the disadvantages of current wildlife luring devices as noted in the prior art, it is reasonable to expect that the present invention would provide energy efficient playback of realistic wildlife sounds while requiring little extraneous movement on the

part of the invention user and would therefore afford the user an excellent opportunity to lure wildlife to within the desired proximity.

The present invention further enhances its effectiveness as a wildlife luring device in that it employs a speaker that can be located an adequate distance from the user so that wildlife attention will be focused on a location other than that of the user.

Furthermore, the present invention utilizes a means of storing audio signals within an integrated circuit in analog format rather than digital format so that no fidelity of the recording is lost during digital to analog conversion.

The present invention further incorporates the use of an effective volume control arrangement that includes a potentiometer used in conjunction with a selector switch. The switch is used to select one of two audio amplifier circuits, of substantially different output power capabilities, within the electrical circuitry to provide for a wide range of audio volume.

The present invention further utilizes a sealed, gel cell type rechargeable battery in conjunction with a recharging device so that ease of use is maintained as compared to the use of disposable batteries, and battery life is enhanced as compared to the use of nickel-cadmium batteries.

Furthermore, the present invention also incorporates the optional use of an auxiliary power cord so that an auxiliary source of direct current, such as an automotive power receptacle, may be used rather than the integral rechargeable battery of the invention.

The present invention further utilizes a plurality of plug-in modules containing unique recordings of various wildlife species such that a specific plug-in module may be used to lure a particular species or species of wildlife.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG 1 is a perspective view of the present invention including the housing with the hinged cover raised to illustrate the top. Also illustrated in FIG 1 is the external speaker and a plug-in module.

FIG 2 is a perspective view of the present invention including the housing, a plug-in module, and hinged cover. The proximal edge of the top is shown pivoted upward to illustrate the plug-in module port.

FIG 3 is a perspective cut-away view of the present invention with the proximal and left lateral sides of the housing partially removed and the circuit board removed to illustrate the rechargeable battery, battery compartment ridge, and circuit board guide.

FIG 4 is a perspective cut-away view of the present invention with the proximal and left lateral sides of the housing partially removed to illustrate the circuit board and module connector attached to the circuit board. The battery charger and auxiliary power cord are also illustrated.

FIG 5 is an electrical schematic illustrating the components and connections of the circuit board.

FIG 6 is an electrical schematic illustrating the connections to the integrated circuit and connector used in a plug-in module.

DETAILED DESCRIPTION OF THE INVENTION

The present invention may be generally described with references to FIG 1 through FIG 6. A housing 10 is provided to enclose the rechargeable battery 23 and circuit board 25 of the present invention. The housing 10 incorporates a top 11, which has attached to it several components of the present invention, and a cover 12. The cover 12 is attached to the distal wall of the housing 10 with a hinge and is secured to the proximal wall of the

housing 10 with a latching mechanism 18. The top 11 is secured to the housing 10 by means of screws passing through the top 11 and into designated receptacles within the housing 10. The housing 10, top 11, and hinged cover 12 are each of molded, one-piece construction. The interior or lower surface of the top 11 includes a molded plug-in module port 19 to facilitate alignment of the plug-in module connector 28b with its respective, mated electrical connector 28a on the circuit board 25.

The housing 10 includes an elevated ridge 24, molded into the interior or upper surface of the bottom of the housing 10 and constructed perpendicular to the plane of the bottom of the housing 10 to provide a physical division to delineate a compartment for the rechargeable battery 23 contained within the housing 10. The ridge 24 is constructed to approximate and incorporate the length and width of the rechargeable battery 23 such that movement of the rechargeable battery 23 in two geometric planes, specifically side-to-side and front-to-back, is restricted and minimized. Hold-down brackets 26, secured with screws to the interior surface of the housing 10 and designed to fit appropriately close to the top exterior surface of the rechargeable battery 23 and to extend from their secured positions partially across the top exterior surface of the battery 23 secure the position of the battery 23 within the housing 10 and restrict and minimize its movement in a third geometric plane, specifically top-to-bottom. The housing 10 contains a circuit board guide 27 which functions to restrict the movement of the circuit board 25 within the housing 10 and to properly position the circuit board 25 within the housing 10 such that it maintains proper alignment with the plug-in module port 19. The circuit board guide 27 is constructed as a bifurcated molding on the interior surface of the two lateral walls of the housing 10 and the interior surface of the bottom of the housing 10 resulting in two juxtaposed and parallel protrusions oriented in two parallel geometric planes such that the circuit board 25 can be positioned and secured between the protrusions. The parallel protrusions are spaced apart slightly more than the thickness of the circuit board 25 and function to maintain proper positioning of the circuit board 25. The top 11 of the housing 10 secures the circuit board 25 within the circuit board guide 27.

The electrical terminals of the rechargeable battery 23 are connected to the circuit board 25 and electrical circuit by means of electrical cables and an associated connector, J5.

The rechargeable battery 23 may be disconnected from the circuit board 25 by means of a cable connector, J5. The speaker connector jack 15, the battery charger connector jack 16, and the auxiliary power cord connector jack 17 are each connected to the circuit board 25 and electrical circuit by means of electrical cables.

The external speaker 20 functions to receive electrical signals from the electrical circuitry of the present invention and convert the signals into audible sounds of pre-recorded wildlife as determined by a particular plug-in module 28 being used at a particular time. The external speaker 20 is connected to the electrical circuitry of the present invention by means of a plug 20a, J1-A, on the terminal end of the speaker cord inserted into a mating connector jack 15, J1-B, located on the top 11 of the housing 10. The speaker 20 may be disconnected from its respective jack 15 when not in use.

The battery charger 21, when powered from a nominal 120 volts alternating current source, provides current to recharge the rechargeable battery 23. The battery charger 21 is connected to the electrical circuitry of the present invention by means of a plug 21a on the outlet end of the battery charger cord inserted into a mating connector jack 16, J3, located on the top 11 of the housing 10. The battery charger 21 may be disconnected from its respective jack 16 when not in use.

The auxiliary power cord 22 may be connected to the electrical circuitry of the invention by a plug 22b on the outlet end of the auxiliary power cord 22 inserted into a mating jack 17, J2, located on the top 11 of the housing 10. Use of the auxiliary power cord 22 connected to an auxiliary 12 volt direct current power source enables the electrical circuitry of the present invention to be powered from an auxiliary source of power rather than the rechargeable battery 23. The inlet end of the auxiliary power cord 22 contains an automotive-type plug 22a suitable for inserting into a 12 VDC power outlet common in many vehicles. The auxiliary power cord 22 may be disconnected from its respective jack 17 when not in use.

Each jack 15, 16, and 17 is unique in its design with respect to the other two jacks of the present invention, and each jack is specifically designed to accept its respective mating plug 20a, 21a, and 22b.

A plug-in module 28, selected from a plurality of available plug-in modules, must be inserted into the plug-in module port 19 and connected to the electrical circuitry of the present invention to enable a pre-selected recording of a particular wildlife specie or species to be played back using the present invention. The plug-in module port 19, an integral part of the interior surface of the top 11, facilitates accurate alignment of the plug-in module connector 28b with its respective mating connector 28a on the circuit board 25. The proximal end of the plug-in module port 19 fits into a mated recess within the proximal wall of the housing 10. The distal end of the plug-in module port 19 terminates in proper alignment with and in close proximity to the plug-in module connector 28a. When a plug-in module 28 is properly and fully inserted into the plug-in module port 19, the plug-in module connector 28b electrically connects a plug-in module 28 to the connector 28a on the circuit board 25 and, consequently, to the electrical circuit of the present invention.

A combination switch-potentiometer, On-Off / Volume Control 13, S1, is used to selectively switch power to the circuit board 25 of the present invention and also to provide control of the audio volume of the played-back wildlife recordings. When S1 is positioned to the "OFF" position, power from either the rechargeable battery 23 or an auxiliary power source is interrupted to the electrical circuit of the present invention. When S1 is positioned to the "ON" position, power from either the rechargeable battery 23 or an auxiliary power source is presented to the electrical circuit of the present invention. Once S1 is positioned to the "ON" position, the included potentiometer influences the level of the audio volume output of the present invention.

A three-pole double-throw (3PDT), low-high volume level switch 14, S2, is provided to enable selection and use of one or both of two audio amplifiers, U1 (LM386) and U2 (TDA1516CQ), located on the circuit board 25. The selection of one or both of the audio amplifiers, U1 or U2, determines the coarse volume level (low or high level) of audio

volume of the played-back wildlife recordings. Selection of the low volume level electrically connects a single audio amplifier, U1, into the electrical circuitry so as to provide a relatively lower audio level to the external speaker 20 than had the high volume level been selected. Selection of the high volume level electrically connects the output of the low level audio amplifier, U1, to the input of a second audio amplifier, U2, capable of relatively higher output than the low level audio amplifier, U1. Selection of the high volume level provides a relatively higher audio level to the external speaker 20 than had the low volume level been selected. The selective use of the low-high volume level switch 14 provides the operator of the present invention with a more selective range of audio volume control.

The circuit board 25 located with the housing 10 contains the electrical components and circuitry necessary to receive and electrically amplify the pre-recorded wildlife vocalizations stored within a plug-in module 28. The electrically amplified wildlife vocalizations are then presented to the external speaker 20 for audible transmission. The circuit board 25 receives nominal 12 volts direct current (12 VDC) from either the rechargeable battery 23 or an auxiliary power source as previously described. A replaceable electrical fuse, F1, located on the circuit board 25, provides over-current protection to the electrical components of the circuit board 25. The 12 VDC supplies power to both of the audio amplifiers, U1 and U2, and also provides power to a voltage regulator, U3 (LM340T/T0), the output of which supplies 5 volts direct current (5VDC) power to the integrated circuit, U4 (ISD2560P), located within a plug-in module 28. The inputs of the low level audio amplifier, U1, are capacitively coupled to the outputs of the integrated circuit, U4, such that the pre-recorded wildlife vocalizations are presented to U1. The output of the low level audio amplifier, U1, is capacitively coupled to both the input of the high level audio amplifier, U2, and one of the electrical contacts of the 3PDT low-high volume level switch 14, S2. When S2 is placed in the low volume position, the following occur:

- (a) 12 VDC negative (-) is connected to the speaker connector jack 15, J1-B negative (-) terminal. This provides electrical reference for U1 output circuit to speaker 20.

- (b) Terminal 5 of the low level audio amplifier, U1, is capacitively coupled to the speaker connector jack 15, J1-B positive (+) terminal. This couples U1 output to the speaker 20.
- (c) Terminals OUT 1 and OUT2 from the high level audio amplifier, U2, are disconnected from the speaker connector jack 15, J1-B negative (-) and positive (+) terminals, respectively. This disconnects U2 outputs from the speaker 20.
- (d) 12 VDC (+) is disconnected from the terminals Vp and M/SS of the high level audio amplifier, U2. This disconnects 12 VDC power from U2.

When S2 is placed in the high volume position, the following occur:

- (a) Terminal OUT 1 of the high level audio amplifier, U2, is capacitively coupled to the speaker connector jack 15 J1-B negative (-) terminal. This provides electrical reference for U2 output circuit to speaker 20.
- (b) Terminal OUT 2 of the high level audio amplifier, U2, is capacitively coupled to the speaker connector jack 15, J1-B positive (+) terminal. This couples U2 output to the speaker 20.
- (c) 12 VDC (+) is connected to the terminals Vp and M/SS of the high level audio amplifier, U2. This connects 12 VDC power to U2.
- (d) 12 VDC negative (-) is disconnected from the speaker connector jack 15, J1-B negative (-) terminal. This disconnects U1 output electrical reference from the speaker 20.
- (e) Terminal 5 of the low level audio amplifier, U1, is disconnected from the speaker connector jack 15, J1-B positive (+) terminal. This disconnects U1 output from the speaker 20.

A plug-in module 28, comprised of a connector 28b and integrated circuit, U4, is partially encapsulated within a composite molding such that only the connector 28b is externally exposed. The plug-in module 28 is electrically connected to the circuit board 25 via mating connectors 28a and 28b, J4-A and J4-B. The plug-in module 28 is shaped such that it fits appropriately within the plug-in module port 19 and aligns the plug-in module

connector 28b with the mating circuit board connector 28a. When the plug-in module 28 is fully inserted into the plug-in module port 19, the plug-in module 28 is electrically connected to the circuit board 25. When connected to the circuit board 25, the integrated circuit, U4, located within the plug-in module 28 receives 5 volts direct current as power from the output of the voltage regulator, U3, located on the circuit board 25. When U4 is powered, analog representations of wildlife vocalizations stored within it are continuously presented, or played back, to the output terminals of U4 which are capacitively coupled to the input of the low level audio amplifier, U1, as previously described. U4 is configured such that when the playback reaches the end of the pre-recorded wildlife vocalizations, the playback loops back to the beginning of the stored vocalizations and repeats the playback. This cycle of playback continues until power is removed from the plug-in module 28.

The preceding description of preferred embodiments and drawings of the present invention are neither intended to limit the scope of the invention nor restrict modifications to the present invention as embodied within the respective claims of the invention.